NOTES.

BARON C. R. VON DER OSTEN SACKEN, author of numerous books and papers on the classification of Diptera, died at Heidelberg on May 20 in his seventy-eighth year.

NOTICE has been received that the title of the Field Columbian Museum, Chicago, has been altered. The institution is now designated the Field Museum of Natural History.

THE death is announced of Dr. Ernst Schellwien, professor of geology and palæontology, and director of the Amber Museum, Königsberg University, in his fortieth year.

DR. E. V. DUNGERN, professor of bacteriology and hygiene in the University of Freiburg (Baden), has been appointed director of the scientific section of the Krebs-institut, Heidelberg.

PROF. ROBERT KOCH has written to the Berlin Medical Society resigning his position on the presidential board on the ground that he expects to remain at least two years in Africa in order to continue his investigations on sleeping sickness in conjunction with the German Imperial Expedition, of which he is the head.

DR. K. PAPE, formerly professor of physics in the University of Königsberg, died at Steglitz on May 9. He was born in Hanover in 1836, and held the professorship of physics in the agricultural academy in Proskau from 1866–1878, that is, until his appointment to the Königsberg chair, which he held until 1904.

IN No. 41 of the *Chemiker Zeitung* is a very useful *résumé* of the experimental advances made during 1905 in the subjects of physics and physical chemistry in so far as they appeal to the chemist. The report deals chiefly with radio-activity, stoichiometry, chemical dynamics, thermochemistry, photochemistry, and electrochemistry.

THE third International Conference on Plant Breeding, whether by hybridisation or by cross-fertilisation, will be held in London on July 30 to August 3 under the auspices of the Royal Horticultural Society. Successful conferences on this subject were held in London in 1899 and New York in 1902. The president of the forthcoming conference will be Mr. W. Bateson, F.R.S.

THE German Bunsen Society for applied physical chemistry held its annual general meeting in Dresden under the presidency of Prof. Nernst on May 20–23. The business of the meeting included some thirty-five papers, in a group of five of which the value and methods of the fixation of nitrogen for industrial and agricultural purposes were discussed, in another group colloidal bodies were considered, whilst other subjects brought forward were such as technical methods for examining explosives, radiation laws, &c.

THE hygienic exhibition in Vienna was opened by Duke Leopold Salvator in the presence of a distinguished company, including some of the chief representatives of Austrian and foreign science, industry, and commerce. Although originating from a private source, the exhibition has, under the support of the municipal and Imperial authorities, and the keen interest displayed by many European exhibitors, proved a great success; the practical results of the more important chemical, hygienic, and medical investigations of the last ten years are well brought out by the numerous exhibits, which have been divided into nine groups:—(1) domestic hygiene; (2) personal hygiene in health and sickness; (3) public hygiene; (4) general industrial hygiene; (5) chemistry, pharmacy, and investigations of foods; (6) hygienic precautions necessary in the liquor and food industries; (7) clothing industries and laundries; (8) travel and association with strangers; (9) hygiene of sport.

ON the recommendation of the Home Secretary, a Royal Commission has been appointed to inquire into the health and safety of miners. Lord Monkswell is chairman of the commission. Science is represented by Dr. J. S. Haldane, F.R.S., university lecturer in physiology, Oxford, and mining engineering by Sir Lindsay Wood, Bart., past-president of the Institution of Mining Engineers. The remaining six members of the commission are politicians and officials of eminence. The secretary of the commission is Mr. S. W. Harris, of the Home Office. Among the questions referred to the commission is whether any change is desirable in the present system of examination for managers' and under-managers' certificates of competency; whether the managers of metalliferous mines should be compelled to hold such certificates; and whether certificates granted by colonial Governments should not be accepted in this country. In view of the great importance of this branch of the inquiry, it is perhaps to be regretted that the commission does not include some recognised authority on mining education. Not any of the commissioners appear to have passed any examination in mining.

DR. L. A. BAUER, who has been in charge of the magnetic survey and observatory work of the United States under the auspices of the Coast and Geodetic Survey since 1899, has accepted an offer, made to him by the Carnegie Institution of Washington, of the post of permanent director of its department of terrestrial magnetism. Since the establishment of this department in 1904, Dr. Bauer has filled the duties of director in conjunction with his official duties in the Coast and Geodetic Survey, but soon after July 1 he will devote his entire time to the Carnegie Institution work, which has developed into what practically amounts to a general magnetic survey of the globe. The annual grants to the department are sufficient to keep in progress continuously an oceanic magnetic survey, besides the sending of expeditions to land areas where no magnetic surveys have as yet been made, and also for conducting various auxiliary investigations. An attempt is to be made to secure the completion of a general magnetic survey of the globe within a period of about fifteen years. During Dr. Bauer's administration of the Coast and Geodetic Survey magnetic work, covering a period of seven years, he has organised and trained a corps of observers, has put in operation five magnetic observatories, has inaugurated magnetic work on the Coast Survey vessels, has practically completed the general magnetic survey of the United States (the three magnetic elements having been observed at about 2500 stations distributed over the United States and outlying territories), and has issued various publications relating to the work.

A PAPER by Mr. Edgar Schuster, on the inheritance of deafness (*Biometrika*, vol. iv., part iv.), was referred to in NATURE of May 17 (p. 63). It was stated in the abstract supplied with the journal that an important point brought out in the paper is "the normal, or even more than average, fertility of deaf-mutes," and this point was mentioned in the note in NATURE. Mr. Schuster writes to say that the meaning can be better expressed by the conclusion "deaf-

mutes have on an average the normal or rather more than the normal number of brothers and sisters, although they appear to have considerably less than the normal number of children."

WE have received from Mr. T. P. Mallock, the well-known taxidermist and anglers' outfitter at Perth, an excellently illustrated catalogue of apparatus connected with salmon and trout fishing.

THE crawfishes of the genus Cambarus inhabiting Mexico, Central America, and Cuba form the subject of a paper by Mr. A. E. Ortmann published in the Proceedings of the Washington Academy of Sciences (vol. viii., pp. 1–24), in the course of which several new forms are described.

THE various modes in which insects are naturally protected—whether by mimicry, by resemblance to their surroundings, or by the offensive weapons with which they are furnished—form the chief subject of discussion in the May issue of *Museum News*. We note that the next number of that periodical will not make its appearance until October.

MR. E. J. SPITTA records some experiments relating to the compound eyes of insects (Journ. Quekett Microscopical Club, April). From these it is suggested that the facets of the insect cornea may be nothing but little holes, filled with some non-refractive medium, by which images may be formed in the same way as a pin-hole forms them. Many difficulties presented by the current theories of insect vision would on this hypothesis be obviated.

THE articles in part v. of the fifth volume of *Annotationes Zoologicae Japonenses* comprise one by Dr. A. Oka on a new genus (Aphanibranchion) of ascidians from Japan; a second on variations in toads and in an isopod crustacean, by Mr. S. Goto; and a third, by Mr. A. Izuka, on collateral budding in an annelid. In the case of the toad the variations consist of the fusion of the seventh and eighth vertebræ, and of the formation of the sacrum by the tenth instead of by the ninth vertebra.

No. 3 of the Philippine Journal of Science (vol. i.) contains the second part of an article by Mr. C. S. Banks on the principal insects attacking the cocoanut palm, and another by the same author on some new Philippine insects. Messrs. W. R. Brinkerhoff and E. E. Tyzzer contribute an elaborate study of experimental variola and vaccinia in quadrumana, in which it is shown that vaccinia protects against variola and *vice versâ*, and that the structures described by Councilman, Magrath, and Brinckerhoff as intracellular parasitic protozoa (the *Cytoryctes variolae*) are present in the lesions.

THE April number of the *Emu* opens with an account of a visit to an ibis "rookery" in a swamp in the Casterton district, Victoria, during the breeding season. The species breeding in the swamp are the straw-necked and the white ibises (*Carphibis spinicollis* and *Ibis molucca*). The firing of a shot reveals the enormous numbers of birds frequenting the rookery. "In a moment there is a wild commotion and the air seems whistling with the sounds of hundreds and thousands of wings, and then in one mighty cloud the whole assembly takes flight, making the sky look black and white; the effect being heightened by the long bills, outstretched necks, and general peculiar appearance of the birds." The coachwhip bird (*Psophodes crepitans*) and its nest form the subject of two excellent reproductions from photographs.

THE work done on the insect-collection of the Oxford University Museum during the past year, and the condition and extent of the collection itself, receive special attention in the report of the delegates of the museum for 1905 (issued as a supplement to the *Oxford University Gazette*). Prof. Poulton lays great emphasis on the value of the services of Mr. R. Shelford, who has gained wide experience and knowledge as curator of the Sarawak Museum. Mr. Shelford's efforts have been chiefly directed to reduce to order the collection of Orthoptera, which, although one of the finest in the world, has hitherto been of little use to entomologists on account of want of proper arrangement and classification. In several sections of the collection—notably the one made by Burchell in South Africa—the insects were altogether unnamed, but this serious deficiency is being rapidly put right by Mr. Shelford's labours. In the course of handling the collection a large number of type-specimens have been identified. Many important additions have been made during the year to the collections generally, the curator of the Pitt-Rivers Museum reporting the acquisition of a number of specimens illustrating the ethnology of many parts of the world.

HAS the Federal Government of the United States power to take remedial measures to prevent the spread of noxious insects, like the cotton-boll weevil or the gipsy-moth, in cases when individual States in the Union are not doing all in their power in this direction or are unable to do sufficient? Such is the question asked by Prof. E. D. Sanderson in the May number of the *Popular Science Monthly*, and from precedents derived from other legislation answered in the affirmative. It is, however, not only in the case of States that refuse to do their duty that the interference of the supreme Government is invoked. A case in point is afforded by the visitation of the gipsy-moth in Massachusetts. At the present time New Hampshire is able to defend its frontier from the pest, but a time will come when action in Massachusetts will alone prevent an invasion of the neighbouring State. Is it fair, it is asked, that one State should be thus heavily penalised for the common good? Individual adaptation to environment forms the subject of an article in the same issue by Prof. J. H. Blair; while Dr. R. W. Shufeldt communicates an illustrated paper on bird-photography in Norway.

IN accordance with instructions of the Government of India, a Bombay correspondent of the *Pioneer Mail* reports, a provincial research laboratory has been established in connection with the existing plague research laboratory at Parel. The main objects of the laboratory are:—(*a*) To afford assistance to all Government medical officers in the discharge of their duties by fulfilling the functions of a "pathological diagnosis institute," to which specimens of all sorts may be sent for opinion. (*b*) To train hospital assistants and others in elementary clinical pathology, performance of inoculations and hypodermic injections, the preparation and use of disinfectants, and other duties they may be called upon to perform in connection with their duties as public health officials. (*c*) To afford opportunities to medical men who may wish to do original work for themselves or to practise or be instructed in new methods of diagnosis.

A REPORT of the fruit conference held in October of last year under the joint auspices of the Royal Horticultural Society and National Fruit Growers' Federation is contained in the April number (vol. xxx.) of the journal of the former society, just issued. The volume includes much

information of value to all who are interested in the cultivation of fruit.

IN the Trinidad Bulletin (April) Mr. J. H. Hart gives a list, with descriptions, of fourteen varieties of orange of which well-established plants can be supplied from St. Clair experiment station. The Pineapple and Jaffa are especially recommended; the list also includes Homosassa, Parson Brown, and Washington Navel; in fact, all the varieties have been carefully selected. A new edition of the guide-book to the Trinidad Gardens is to be published shortly, in which there will be special references to the features depicted by Kingsley in "At Last."

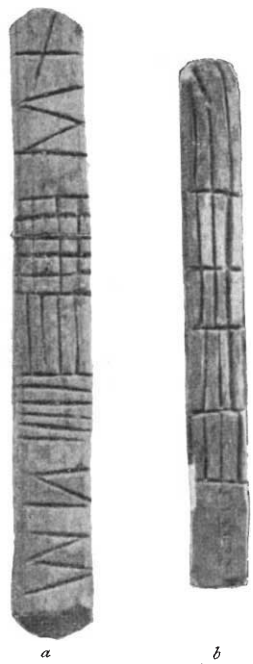
THE North American species of Festuca are collated by Mr. C. V. Piper in vol. x., part i., of the Contributions from the United States National Herbarium. In North America twenty-two perennial and twelve annual species are recognised, as compared with twenty-eight perennial and twenty-six annual species in Europe. In addition to the sheep and red fescues, *Festuca altaica* and *Festuca viridula* are regarded as excellent fodder grasses, and *Festuca octoflora* is valuable in semi-arid districts. The term "lemma" is adopted to signify the outer or lower palea. A number of plates accompany the text, and a tentative list of Mexican species is appended.

BOTANISTS who have attempted to classify the different varieties of such plants as rice, cotton, &c., that are extensively cultivated in India have noted the extraordinary power of discrimination manifested by the peasant cultivators. In a Bulletin (No. 55) recently published by the Madras Department of Agriculture on the great millet, *Sorghum vulgare*, a plant grown very widely as a food and fodder crop, Mr. C. K. Subba Rao enumerates with comparative notes more than sixty forms referable to seven botanical varieties. Three of these varieties are represented in other parts of India, and in addition there are the forms that would be grouped under fifteen varieties that are not represented in the presidency.

THE latest number, vol. xix., part i., of the Transactions of the Royal Scottish Arboricultural Society contains, as usual, a number of interesting papers on forestry subjects. A working plan for the Alice Holt woods in the east of Hampshire has been prepared by Dr. Schlich. In 1812 an Act was passed providing for the cultivation of navy timber in the forest, but owing to the low standard of the oak trees that occupy 95 per cent. of the area it is proposed to plant certain portions with beech, larch, and Douglas fir, and others with spruce and pine. Dr. R. S. MacDougall reports the discovery of larvæ of the chalcid species *Megastigmus spermotrophus* in seed of the Douglas fir received from Aberdeenshire, and adduces evidence to prove that the larvæ are really plant parasites. Mr. G. Brown provides some figures in connection with the natural regeneration of Scots pine at Beauly, and Prof. T. Hudson Beare points out a few of the difficulties in obtaining accurate results when testing timbers.

AN excess of rain is again shown by the weekly weather report of the Meteorological Office to have occurred over the entire country for the period ending May 26. The heaviest rains were experienced in the south-west of England, the measurement for the district being 1·64 inches, which is more than three times the average. The rainfall was about double the average in different parts of the kingdom. The aggregate rainfall for the spring months is deficient in the Midland counties and in the south and east of England, as well as in the Channel Islands, but mostly in excess in other parts of Great Britain. The total measurement since the commencement of the year is everywhere considerably in excess of the average.

THE eighth Bulletin of North Queensland Ethnography is entitled "Notes on Government, Morals, and Crime," but the four plates and part of the text deal with message sticks. Dr. Roth takes the view that they are merely mnemonic, and convey no communication properly so called. This statement seems to require qualification outside the area with which he deals; for instance, among the Mundainbura of Durham Downs certain marks have recognised meanings, and indicate the marriage classes; in a case reported by Dr. Howitt another tribe with the same classes interpreted correctly a stick sent to put this question to the test. The ordinary use of the stick is, however, mnemonic, and it also guarantees the *bona fides* of the messenger. In North Queensland the stick is sometimes carried at the end of a rod, as shown in NATURE of April 26 (vol. lxxiii., p. 610), but held vertically; the object of this is unknown. In addition to being figured in the plates, the thirty-three specimens are elaborately described. The purely mnemonic character of Dr. Roth's specimens is shown by the accompanying figures, which are alternative forms of stick for the same message. Interesting information is also given on customs of inheritance, a remarkable feature being the succession of females only to property in certain edible plants.



a *b*

FIG. 1.—So-called "letter" or "message" sticks, Boinjé tribe, Boulia. (*a*) Length, 6½ in.; breadth, ⅜ in. (*b*) Length, 5¾ in.; breadth, ⅝ in., made in place of (*a*), which was stated to have been lost, in order to ascertain whether the same message necessitated similar markings, which it clearly did not.

WE have received a copy of the meteorological report of the Survey Department of Egypt for the year 1903, containing hourly observations at Abbassia Observatory (Cairo), monthly summaries at eighteen climatological stations in Egypt and the Sudan, and some additional rainfall results. The value of the work is much enhanced by graphical representations of the Abbassia observations. In a preliminary examination of some of the data, the superintendent points out that the rainfall at Abbassia and the southern Delta generally is small and irregular, but that it was thought worth while to see whether it showed any signs of periodicity such as that assigned to it in India or Mauritius by Sir Norman Lockyer. A smoothed rainfall curve for the years 1888–1900 shows some resemblance to the inverse sun-spot curve, especially in the coincidence of the maximum of the sun-spots and the minimum of the rainfall in the year 1893.

DR. W. N. SHAW'S lecture at the University of London on May 24 brought this most interesting series to a close. The audience no doubt shared the lecturer's views as to the difficulty of dealing sufficiently with the subject in the space of four hours; we hope that the matter will not

be allowed to drop, and that the example set by the London University will be followed by other institutions. The subjects specially dealt with in this last lecture were the variations in the several elements from year to year, the relation of the yield of wheat to rainfall in the British Isles, and illustrations of sequences in seasonal variations in various parts of the globe. Some slides lent by Dr. Lockyer showed very clearly the opposite variations of the pressure curves for different localities, and the similarity between the march of rainfall and inverted pressure curves. The lecturer pointed out that several such relations were beginning to be detected, but that more work was wanted; some of the results could only be considered as temporary at the present time. Some very remarkable illustrations were given of the apparent dependence of the yield of wheat on the rainfall of the previous autumn, although other factors, *e.g.* temperature and spring rainfall, undoubtedly exert an influence on the general result. The values seemed to show an unmistakable relation to an eleven years' periodicity. Diagrams were also shown exhibiting an apparent notable connection between the south-east trade wind velocity in the Atlantic and English rainfall (see also NATURE, December 21, 1905).

THE Maryland Geological Survey has established a permanent State mineral exhibit in the old House of Representatives at Annapolis. We learn from *Science* that the materials forming this exhibit have been gradually collected by the survey during the last few years, the nucleus being the Maryland mineral exhibit at Buffalo in 1901. This was materially added to in the preparation of the State's exhibit at Charleston the following winter, and was still further increased for the Maryland exhibit for the Louisiana Purchase Exposition at St. Louis in 1904. The latter display has again been much enlarged for the present purpose, and is intended to illustrate thoroughly the mineral resources and industries of the State.

WE have received a copy of the report issued by the Home Office (Cd. 2911, price 1*s.* 9*d.*) on statistics relating to persons employed, output, and accidents at mines and quarries in the British colonies and in foreign countries in 1904. The number of persons employed at home and abroad was about five millions, of which one-fifth were employed in the United Kingdom and one-third in the British Empire. More than half the total were employed in getting coal, of which the world's production was 886 million tons, valued at 295 million pounds sterling. Of the world's gold output, 16,593,856 oz., valued at 67,000,000*l.*, the British Empire supplied 60 per cent., the Transvaal contributing 22$\frac{3}{4}$ per cent., Australia 22$\frac{1}{2}$ per cent., and Canada 4$\frac{3}{4}$ per cent. The United States contributed 23$\frac{1}{2}$ per cent. In coal mines the death-rate from accidents per 1000 employed was 1·24 in the United Kingdom, 1·24 in the British Empire, 1·90 in Germany, and 3·35 in the United States.

THE *Pioneer Mail* states that the establishment of permanent wireless telegraph stations at Frasergunj and Akyab is now under the consideration of the Government of India.

THE April and May numbers of the Journal of the Franklin Institute are devoted almost entirely to a report of the proceedings on the occasion of the 200th anniversary of Franklin's birth. An address delivered by Prof. Edwin J. Houston, on Franklin as a man of science and an inventor, is printed in full, and gives an extended account of the life-work of the great discoverer. An account is also given of the Benjamin Franklin trust funds to the cities of Boston and Philadelphia. The Journal of the Society of Arts for April 27, referring to the bicentenary celebration, of which an account was given in NATURE of May 10 (p. 36), provides interesting particulars of Franklin's relations with the Society of Arts.

MESSRS. DICKINSON AND SHIELDS, Alliance Mills, Stoke Newington, have sent us a short pamphlet with respect to their bubble fountain, the chief fault of which is that it does not contain any description of how the bubble fountain is formed. However, assuming it to be formed, the bubble fountain consists of a series of soap bubbles, made even at the rate of 20,000 per minute, which may be blown with coal gas, and sent up by day or by night, when, if illuminated by the sun or artificially, it affords an interesting and beautiful phenomenon. At night, further interest may be given by firing the fountain, when the flame will run up the stream of bubbles. Intermittent groups of bubbles are suggested as an excellent target for gun practice, cheaper than glass or clay, and obviously it is more humane than the murder of live pigeons. It is stated that a large example may shortly be seen at the Crystal Palace.

ON the British Association journey to and from South Africa a careful watch was made by many members of the party for the "green ray" visible for an instant just at the time of disappearance of the setting sun below a clear horizon. A note has been contributed on this subject to *Symons's Meteorological Magazine* for March and April by Prof. Rambaut, F.R.S., who was one of the party. Prof. Rambaut finds that the phenomenon can be entirely accounted for by the generally received view of the chromatic dispersion of the atmosphere combined with selective absorption. It is not necessary to make elaborate experiments or to go a sea voyage in order to observe the "green ray." By fixing a screen half covering the focal plane of a telescope, or, better still, a diaphragm with a narrow diametral slit, a green or blue flash can be seen at the top of the sun's disc and a red fringe at the bottom any time that the sun is near the horizon, and the observation can be repeated as often as desired.

"THE Grape Curculio" is the title of the 100th Bulletin of the West Virginia University Agricultural Experiment Station at Morgantown, in which Mr. F. E. Brooks deals with the damage inflicted on vineyards by the weevil *Craponius inaequalis*. For several years past complaints have come from vine-growers in Virginia in regard to insects that "sting" grapes, causing them to become "wormy" and to drop from the vines while unripe. The insect is the above-named weevil, and careful experiments have been conducted with the view of mitigating the damage caused by its attacks. Spraying and protecting the clusters by enclosure in bags are recommended as the most effectual remedies.

THE first division of the third part of the catalogue of the Indian decapod crustacea in the collection of the Indian Museum has been received. Part iii. deals with the Macrura, and in the section just issued Dr. A. Alcock, F.R.S., describes the prawns of the Peneus group.

IN the notice of the okapi in our last week's issue (p. 88) the description of the animal's habitat should have been attributed to Captain Gosling instead of to Captain Alexander.

MESSRS. PHILIP HARRIS AND CO., LTD., have just issued an illustrated catalogue of instruments for practical work

in geography. The catalogue includes descriptions of simple instruments for map making and other field work, determination of position, and meteorological observations.

IN the notice of "Oologia Universalis Palæarctica" in NATURE of May 24 (p. 79) reference was made to the shortcomings of the English text. Messrs. Williams and Norgate ask us to state that arrangements have been made with Mr. Oliver G. Pike to revise the English text, so that in future the work may not suffer from imperfections of expression due to poor translation.

THE "Statesman's Year-book" (Macmillan, price 10*s.* 6*d.* net) continues to grow in size and value. The 1906 issue is some 150 pages larger than its immediate predecessor. Separate notices of the States included in the American union have this year been introduced for the first time. Recent important events have led to other changes in the year-book, and among these may be mentioned the dissolution of the union between Sweden and Norway, the peace between Russia and Japan, the mission to Tibet, and the last general election. The maps and diagrams, which are always an attractive feature of the publication, this year deal with the economic development of the United States, the new provinces of Canada, the division of Bengal, the Anglo-Portuguese Barotse boundary, the political changes in the Far East, the races of Russia, and the tariff chart of the world. The volume now runs to lxiv+1604 pages. The editor, Dr. J. Scott Keltie, is to be congratulated upon the forty-third issue of this indispensable work of reference.

OUR ASTRONOMICAL COLUMN.

ASTRONOMICAL OCCURRENCES IN JUNE:—

June 2. 15h. Conjunction of Venus and Neptune. (Venus 2° 24′ N.).
7. 10h. 45m. to 11h. 51m. Moon occults μ Sagittarii (mag. 4·0).
10. 3h. Jupiter in conjunction with the Sun.
,, 13h. 43m. to 14h. 46m. Moon occults ι Capricornii. (mag. 4·3).
12. 18h. Saturn in conjunction with the Moon. Saturn 0° 56′ N.).
15. Venus. Illuminated portion of disc =0·849. Of Mars =0·997.
16. 10h. 19m. Minimum of Algol (β Persei).
21. 21h. Sun enters Cancer. Summer commences.
24. 10h. Venus in conjunction with the Moon. (Venus 2° 29′ N.).
26. 5h. 3m. Moon approaches very near to α Leonis (Regulus).
28. 16h. Uranus in opposition to the Sun.
,, Saturn Outer major axis of outer ring =41″·47. Outer minor axis of outer ring =2″·31.

PHOTOGRAPHING THE CORONA WITHOUT A TOTAL ECLIPSE.—Numerous experiments have been devised and carried out in the attempt to obtain photographs of the solar corona during ordinary sunlight, without waiting for the rare occasions on which the sun is totally eclipsed. Hitherto no decided success has rewarded these efforts, but another attempt is to be made by MM. Millochau and Stefanik with an equipment mounted on the summit of Mont Blanc.

These observers propose to employ a spectroheliograph such as is now used at several solar physics observatories to obtain monochromatic images of the chromospheric clouds and prominences, but, instead of using one of the calcium or hydrogen lines on the second slit, they propose to isolate the chief corona line, at λ 5303, and to eliminate the light of other radiations by means of an appropriate green screen.

Preliminary experiments with this apparatus at Meudon have given encouraging results, and the observers hope that, in the clear atmosphere of the mountain summit, indubitable success will be attained (*Comptes rendus*, No. 17, 1906).

TERRESTRIAL TEMPERATURES AND THE SOLAR RADIATION.—In the report of the Smithsonian Institution for the year ending June 30, 1905, Mr. C. G. Abbot, who has charge of the Astrophysical Observatory, discusses the recent observations of solar radiation and its connection with terrestrial temperatures.

This matter was discussed by the late Prof. S. P. Langley in the *Astrophysical Journal* for June, 1904, who then arrived at the conclusion that the evidence available indicated that the total solar radiation may vary in comparatively brief periods, and that the irregular variations were frequent and large enough to produce considerable changes of the earth's mean temperature.

In the present communication Mr. Abbot summarises the results obtained since 1902, and, by comparing the values found for the transmission of the solar envelope, and the consequent transmission of the solar radiations to the earth, with the variations of temperature at a number of stations situated in the terrestrial north temperate zone, he has deduced evidence which strongly supports Prof. Langley's theory.

High values of solar radiation and solar transmission appear to precede and to accompany high temperatures in the north temperate zone, and *vice versâ*.

The tables and curves which appear in the report substantiate this view, and Mr. Abbot expresses the hope that the study of the solar radiation will soon prove a valuable aid in forecasting climate.

THE DISTRIBUTION OF THE STARS.—In No. 7 of the Publications of the Groningen Astronomical Laboratory Prof. Kapteyn published the material on which he based his studies on the distribution of the stars in space, the distribution of cosmical velocities, &c., and also gave the results of five separate computations based on three different values of the precession and three different positions of the apex of the solar motion.

In this publication 2640 stars of Bradley's catalogue were grouped in ten degrees of declination, and the results given in two tables, the first of which contained the stars having spectra of Secchi's second type, the second the stars of type i. and unknown spectra.

No. 9 of the same publications contains the results of a *sixth* computation based on more refined data and arranged in a different manner. Instead of grouping the stars according to declination, Prof. Kapteyn has arranged them in zones of Galactic latitude, because, in considering the structure of the universe, it is obviously desirable to take the Milky Way as the fundamental plane. Also, instead of including the stars having unknown or peculiar spectra with those of type i., he has placed them in a table by themselves. In this way he has discussed the distribution and proper motions of 1093 stars belonging to type ii., 1144 stars belonging to type i., and 381 stars the spectra of which have not yet been recognised as belonging to either of Secchi's groups.

The complete catalogue should prove of exceptional interest and usefulness to anyone engaged in any discussion on cosmical evolution, and it would be exceedingly interesting to see what modifications might be necessary if the stars were divided into subgroups according to their ascending and descending temperatures as given in Sir Norman Lockyer's classification.

OBSERVATIONS OF COMETS.—The results of a number of observations of various comets, made at the Chamberlin Observatory (Denver) by Prof. H. Howe during the period November, 1904, to June, 1905, appear in No. 4091 of the *Astronomische Nachrichten*.

Six comets are included, of which comet 1905 i. (Encke) was observed from November 11 to December 27, 1904, and at times appeared to have a faint nucleus and an eccentric, fan-shaped tail. At 6h. 20m. (local M.T.) on December 5 a star of mag. 9·0 shone so lustrously through the comet that the nucleus was invisible.

Half an hour later the nucleus, which was near the following end of the comet, was plainly visible.